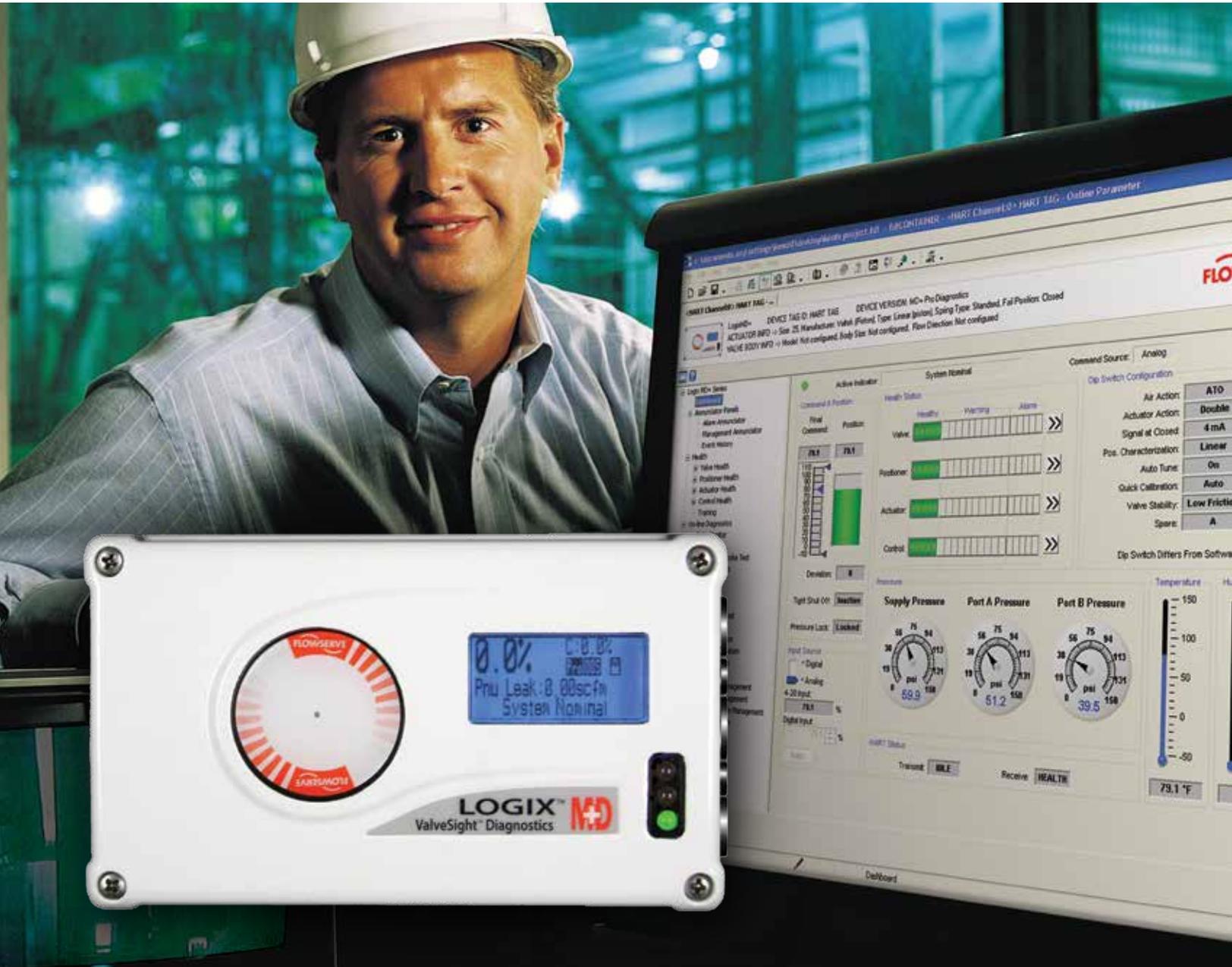




LOGIX MD+ Digital Positioner

Redefining total cost of ownership for your enterprise



Experience In Motion



Flowserve® – Solutions to keep you flowing

Flowserve is one of the world's leading providers of fluid motion and control products and services. Globally, we produce engineered and industrial pumps, valves, seals, systems, and automation equipment, and provide a range of related flow management services. Our solutions move even the most volatile and corrosive fluids safely and securely through some of the most extreme temperatures, terrain, and challenging operating environments on the planet.

Flowserve products and services are specified for use in a vast range of industries, including oil and gas, chemical, power generation, and various general industries.



Logix MD+ Digital Positioner

In what continues to be an increasingly competitive economic environment, commercial and municipal plants are being asked to establish and maintain high quality processes while **maximizing uptime**, and **minimizing production costs**. Any unplanned shutdown can significantly affect the economic outlook of the plant and its employees and the downsizing of trained maintenance staff has impacted the ability of plants to meet these control system challenges.

The resulting business climate has become a driving force behind a new and rapidly evolving approach to equipment purchases: **total cost of ownership**.

Equipment requiring long commissioning times, unreliable control, or frequent repairs could drive up the actual cost of ownership dramatically. Alternatively, a product that is easy to set up provides years of reliable service and has its own diagnostic warnings may significantly reduce the overall cost of ownership over the life of the product. With the Logix 520MD+ model, purchase price may well have the least impact on overall cost.

Fast commissioning, accurate production, powerful diagnostics

To minimize your total cost of ownership and maximize productivity, Flowserve developed the Logix MD+ digital positioner. The Logix MD+ digital positioner allows for fast, simple commissioning, extremely accurate and reliable control, and diagnostic features that provide powerful and easy ways to determine when maintenance is required.

To protect your company assets to the fullest, talk to your local Flowserve sales representative to learn more about true total cost of ownership.



The Logix MD+ allows for fast commissioning, accurate and reliable control, and powerful diagnostic features that provide easy ways to determine when maintenance is required.



The Logix 520MD+ Total Cost Advantage

Simple Installation

New mounting options for the Logix MD+ continue to expand the array of control valves that can be managed.

Mounting Options: Mounting holes, pneumatic ports and electronic ports are offered in Metric and English threads. Reliable linkages are easy to install. A FlowTop direct mounting kit, VDI/VDE 3847 mounting kit, and gage blocks are all available.

Valve and Actuator Options: Configurable for rotary or linear valves, double or single acting actuators, air to open or air to close, very large to very small actuators, split range, custom characterization, precision linearization and more.

Configuration and Cloning Tools: Clone configuration, alarm settings, alarm history, and/or historical trend data. ValveSight™ allows easy uploading of any Logix MD+ configuration. Newly installed Logix MD+ positioners can be configured exactly as the previous positioner, or edited as desired, with the simple click of a mouse.

Vented Option: When using sweet natural gas, use threaded exhaust ports to exhaust gas to a safe environment.

Remote Mount Option: Use the remote mount feedback option for extreme environments.

Powerful Features

- **Calibration:**
Fast, accurate one button Quick-Cal
- **Mounting:**
Versatile, including NAMUR options
- **Commissioning:**
No software required
- **Interface:**
Easy buttons with LCD option and high visibility LED's for operational status
- **DTM:**
Highly advanced with Dashboard giving instant status visibility
- **Performance:**
Superior control, high air capacity, low air consumption
- **Auxiliary Cards:**
Up to 2 at a time with Analog Out, Discrete Out, or Discrete Input
- **Diagnostics:**
Extensive coverage, historical data, all events logged with time-stamps
- **Signatures:**
Detailed reports, easy comparisons, exportable

The Logix 520MD+ Total Cost Advantage

- Simple Installation
- Fast, Easy Commissioning
- Fully Featured Design
- Accurate and Reliable Service
- Easy to Maintain
- Competitive Pricing



Fast, Easy Commissioning

Commissioning with the Logix MD+ positioners is fast and easy. Basic set-up, calibration, and tuning do not require software or PID expertise and can be accomplished very quickly.

Quick-Cal One-Button Calibration: Simply set the configuration DIP switches and press the *Quick-Cal* button. In seconds* the Logix MD+ is ready for control. The advanced tuning process optimizes the tuning parameters quickly and automatically.

Easy User Interface: The Logix MD+ local user interface lets you configure the basic operation, calibrate, and tune the response of the positioner with no additional tools or configurators. Blinking, high visibility LEDs allow you to see status from a distance.

LCD Screen: With the optional LCD screen, quickly use advanced functions and view the system status in 8 languages. The main LCD view shows command and position and other important information using icons and scrolling status lines – all visible without removing the cover. Directional buttons allow you to navigate the menu to locate detailed information and perform commonly used functions.

ValveSight™ DTM Software: Advance DTM software provides an intuitive, powerful user interface for all positioner commissioning, monitoring and diagnostic functions and custom settings.

**Typical calibration time for actuators 25 square inches or smaller is less than 45 seconds. Calibration time depends on total stroke time.*



The Logix 520MD+ User Interface



ValveSight DTM Software

The advanced features of the Logix 520MD+ give you the flexibility to work in a wide range of applications.



Fully Featured Design

The Logix MD+ positioners integrate advanced features in a simple package. They give you the flexibility to work in a wide range of applications and the simplicity to allow you to get running quickly.

Powerful Processor: A fast CPU with a real-time clock and plenty of memory enables the processor to store signatures and time-stamped event histories, calculate diagnostic functions, and maintain precise position control.

Environmental Sensors: Supply pressure, actuator pressure, temperature and humidity sensors detect developing issues and prevent failures.

Powerful Diagnostics: Over 130 independent diagnostic evaluations during calibration and normal operation provide you with a fast and accurate way to troubleshoot any issue.

Signatures: A variety of signatures record snap-shots of valve behavior for future comparisons and easy maintenance analysis.

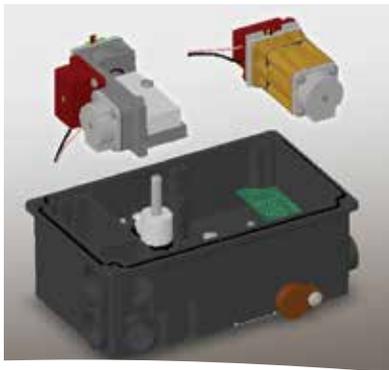
Auxiliary Cards: Auxiliary cards expand the possibilities of communication and control. Up to 2 cards can be used at one time.

The Logix MD+ Multifunction Card (MFC) can be configured to act as an analog output (AO), discrete output (DO), or discrete input (DI). As an AO, the card reports the position of the valve with a mA current. As a DO, the card can be configured to limit output current when any of the diagnostic alarms are triggered. As a DI, setting a high voltage across the terminals can trigger the valve to move to a defined set point, or to begin a Partial Stroke Test.

Limit switches: A variety of Logix MD+ limit switch kits are available to provide you with an independent verification of the position of the feedback shaft.



Auxiliary Card Being Installed



Shown left:

- **Heavy Duty IP66 Housing** with thicker walls, better gasket design; improved threads
- **Modular Relay Design** allows for ultra-high double acting flow or optimal single acting performance with minimal air consumption

Accurate and Reliable Service

High quality processes rely on accurate and reliable positioners. The Logix MD+ positioners are designed with the latest technology to support precise control and keep the positioner in service for years.

Superior Control: Precision components, inner loop control and advanced control algorithms provide Logix MD+ digital positioners with the accuracy and reliability demanded by the most critical applications.

Independent PID Gains: Independent gains for opening and closing directions are automatically set during the *Quick-Cal* and allow for optimal performance with actuators with heavy springs or process loads.

Selectable Gain Switch: A rotary switch allows you to instantly boost the responsiveness or stability of the valve without dealing directly with PID values.

Two Relay Styles: Two relay options are available to optimize your valve system performance. The high capacity spool relay will quickly move large actuators with ease and are ideal for small actuators that need the fastest response. The low air-consumption poppet relay offers great performance on single acting valves when air consumption is critical.

Heavy Duty Housing: Rated at IP66, the housing provides tough protection from dust, liquids and impact in the most demanding environments. Anodized aluminum and epoxy powder paint minimize corrosion in wet, salt-water environments.

Purge Option: Configure the positioner to purge the spring area with instrument air to avoid corrosion in single acting low bleed actuators.

Certified for Hazardous Areas: Intrinsically safe electronics meet ATEX, IECEx and North America (cFMus).

Designed for Safe Shut-Down: Engineered with quality and reliability built in. Designed to move to the fail-safe position when current drops below 3.6 mA per IEC 61508 Safety Integrity Level 3 (SIL3) requirements.

Easy to Maintain

Logix MD+ positioners come with numerous diagnostic tools that allow the positioner to **automatically pinpoint the root cause of an issue**. Should the issue be in the positioner, the Logix MD+ modular design makes it easy to change components using standard tools.

Comprehensive On-Line Diagnostics: The Logix MD+ positioner has over 130 helpful warnings alarms that roll up into intuitive health values. These onboard diagnostics evaluate key valve, actuator, positioner, and control parameters against potential failures, Logix MD+ digital positioners deliver real-time data to alert you of existing and potential risks, reduce the number and frequency of unplanned shutdowns, and help minimize exposure to loss. Powerful online monitoring capabilities include friction, pneumatic leak, and actuation ratio.

Intuitive Health Display: All alarms and warnings are summarized in simple health values displayed on the ValveSight DTM dashboard. One glance shows any issues and severity. A click of the mouse shows detailed information and possible solutions to quickly pinpoint the root cause of the issue. Or, quickly adjust the alarm settings to more helpful limits.



Shown right:

- **New Embedded Code Features** provide extensive diagnostics, helpful histograms, and detailed signatures
- **Intuitive Health Displays** show issues and severity at a glance. Possible solutions to the root cause are at your fingertips



Meaningful Alarm Limits:

When the positioner first comes on line, Training Mode tracks key parameters such as position, supply pressure, and friction. Histograms provide a quick, easy visual display to help you set meaningful alarm and warning limits. Training begins automatically or can be configured to run at any time.

Overview of Current Alarms:

View all current alarms, warnings and other states using the annunciator panels in the ValveSight DTM or scrolling status feature on the LCD. All alarms can be masked to allow easy management.

Extensive Alarm History:

A 200-event on-board history of all alarms, warnings and calibrations make it easy to see a progression of events. All events are time-stamped with the on-board real-time clock.

Possible Solutions: Every alarm includes a concise statement of its meaning along with list of possible solutions. This can be found quickly in the Instruction Manual* or with a few clicks in the ValveSight DTM.

*See document number LGENIM0105

Continuous Testing: With valves that typically stay in one position, the optional continuous stroke test (CST) allows the positioner to continuously monitor and diagnose the system by stroking the valve very slightly.

Long-Term Trends: Logix MD+ positioners track 14 parameters over 15 years to help determine changes in processes or performance.

Real-Time Data Monitor:

The data monitor is a real-time log for many positioner parameters and is displayed on the ValveSight DTM. It logs data over HART communications and is used to view and track the current state of the valve system.

Off-Line Analysis: Detailed off-line signatures help you determine which valves need repairs and prevent expensive unnecessary equipment maintenance and replacement costs. Viewed with an intuitive, easy to use user interface, valve signatures are filled with detailed performance information. This allows maintenance engineers to pinpoint valves with potential issues during shut-down.

- **Ramp Tests** evaluate thrust and friction values over a length of stroke.
- **Step Tests** shows immediate responsiveness of the valve.
- **Partial Stroke Tests** evaluates the responsiveness with pass/fail criteria. The positioner stores settings and results of the last 20 tests.
- **HDRL Tests** determines hysteresis, deadband, repeatability, and linearity with the click of a button.

Using ValveSight, print test reports, compare signatures, and export data.

Modular Design: The Logix MD+ positioners are designed to withstand the severe environments. Should a problem arise, service is easy with a modular design that requires simple tools. Replacement kits are available for most components.

Easy Return Policy: Logix MD+ positioners are warranted for 1 year from the time of shipment. See Flowserve *Worldwide Terms and Conditions of Sale* for restrictions and details.

Logix MD+ Specifications and Certifications

Product Range	
Resolution	≤ 0.25%
Linearity	+/-1.25%
Repeatability	≤ 0.25%
Hysteresis	≤ 1.0%
Deadband	≤ 0.3%
Sensitivity	≤ 0.25%
Stability	≤ 0.4%
Long Term Drift	≤ 0.5%
Supply Pressure Effect	≤ 0.2%

Output Air Capacity	
Single Acting Relay	20.8 Nm ³ /h @ 4.1 bar (12.2 SCFM @ 60 PSI)
Double Acting Relay	30.6 Nm ³ /h @ 4.1 bar (18.0 SCFM @ 60 PSI)

Air Consumption	
Single Acting Relay	0.082 Nm ³ /h @ 4.1 bar (0.048 SCFM @ 60 PSI)
Double Acting Relay	0.637 Nm ³ /h @ 4.1 bar (0.375 SCFM @ 60 PSI)

Temperature Range*	
Operating, Storage	-52 to 85°C (-61.6 to 185°F)

* Reduced performance at low temperatures

Hazardous Area Certifications

ATEX, IECEx, North America (cFMus)

Safety Certifications

Meets Safety Integrity Level 3 (SIL 3) per IEC 61508

Communications Certifications

DD and DTM pending certification by the HART Communications Foundation

For more information see document number LGENIM0105

Communications

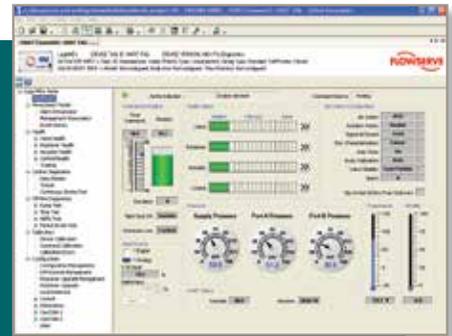
ValveSight™ FDT/DTM Technology

ValveSight™ DTM software utilizes FDT/DTM technology and HART protocol to give you 24/7 access to monitor any Logix MD+ positioner on your network – all from a single workstation or DCS.*

ValveSight streamlines and simplifies your ability to quickly and accurately assess the health of any attached Logix device, allowing you to deal with existing problems directly and better understand the magnitude of any developing issues. View friction, response time and other important system metrics. Store configuration and calibration histories and view event logs for each digital positioner on your network. Even create reports for configuration, calibration, and event data.

The ValveSight Dashboard

Open the Dashboard window to gain real-time feedback on the status of your valve including valve stem position, control signal, health indications and active alarms, basic positioner configuration, actuator and supply pressures, supply air humidity, and positioner temperature.



- ValveSight™ DTM Annunciator panels show the current status of all alarms.
- ValveSight™ DTM Health pages show detailed alarm status, list implications and possible solutions and allow you to configure the alarm limits.
- ValveSight™ DTM On-Line Diagnostics pages allow you to monitor and log the positioner sensors, see long term trends and configure the continuous stroke test.
- ValveSight™ DTM Off-Line Diagnostics pages allow you to run Ramp, Step, HDRL and Partial Stroke Tests.
- ValveSight™ DTM calibration and configuration screens fully support Logix MD+ functionality.

Common Interfaces

Logix MD+ positioners are supported by a fully functional DD. They work with handheld communicators and all major Distributed Control Systems (DCS).

* AMS Snap-On™ also available.

HART 5, 6 or 7 Protocols

- ValveSight and Logix MD+ Positioners support HART 5, 6 and 7 protocols.
- Logix MD+ positioners are shipped standard with HART 6.
- Easily change protocols with the flip of a switch.

License Levels

ValveSight™ FDT/DTM

ValveSight™ DTM software provides a powerful, yet easy to use interface to the Logix MD+ digital positioners. Two license levels are available Basic and Advanced.

- Basic DTM license level provides all of the functionality you need to configure and monitor your Logix MD+ positioners.
- Advanced DTM license level adds an upgraded Dashboard with the intuitive Health bar display, additional health pages to monitor Friction, Pneumatic Leak, Actuation Ratio, Command and Position Frequency and Amplitude, and Training. Also included are pages to view trends, continuous stroke test, HDRL comparisons, PST comparisons and a PST scheduler.

Logix MD+ Positioner

Logix 520MD+ digital positioners offer HART communication and three levels of diagnostics – Standard, Advanced, and Pro.

- Standard diagnostics provide complete safety and position-related diagnostics and data.
- Advanced diagnostics provide additional pressure data.
- Pro diagnostics provide powerful on-line monitoring capabilities and enhance off-line tests with additional force data.

Logix 510MD+ digital positioners offer a low cost option with no digital communication.

New Dongle Licensing Option

- License any DTM – just plug in the dongle.
- Transfer positioner upgrades to any computer.



Feature List for Logix® 520MD+ and ValveSight™ DTM



		ValveSight™ DTM		Logix® 520MD+ Positioner		
		Basic	Advanced	Standard	Advanced	Pro
Overview	Dashboard	✓ 1	✓	✓ 1, 2	✓ 1	✓
	All-Alarm Annunciator	✓ 1	✓	✓ 1, 2	✓ 1	✓
	Alarm and Calibration History	✓	✓	✓ 1, 2	✓ 1	✓
Configuration	Multi-Function Cards (up to two) (Configurable Analog Output, Discrete Output, or Discrete Input)	✓	✓	✓	✓	✓
	Configuration Management	✓	✓	✓	✓	✓
	Custom Stroke Characterization	✓	✓	✓	✓	✓
	Local Interface Control	✓	✓	✓	✓	✓
	Custom Units of Measure	✓	✓	✓	✓	✓
	All-Variable Editor	✓	✓	✓	✓	✓
	Tight Shutoff	✓	✓	✓	✓	✓
	Soft Limits	✓	✓	✓	✓	✓
Calibration	Stroke Calibration	✓	✓	✓	✓	✓
	Analog Input Calibration	✓	✓	✓	✓	✓
	Analog Output Calibration	✓	✓	✓	✓	✓
	Pressure and Friction Calibration		✓		✓ 1	✓
Off-Line Diagnostics	Ramp Test	✓	✓	✓ 1, 2	✓ 1	✓
	Step Test	✓	✓	✓ 1, 2	✓	✓
	HDRL Test	✓	✓	✓	✓	✓
	Partial Stroke Test	✓ 1	✓	✓ 1, 2	✓ 1	✓
	Partial Stroke Test Scheduling and Comparing		✓			✓
	Test Comparisons	✓	✓	✓ 1	✓ 1	✓
	Test Reports and Printing	✓	✓	✓	✓	✓
	Test Data Exporting	✓	✓	✓	✓	✓
On-Line Diagnostics	Deviation	✓	✓	✓	✓	✓
	Position Alerts	✓	✓	✓	✓	✓
	Valve Cycles and Travel	✓	✓	✓	✓	✓
	Bellows Cycles and Travel	✓	✓	✓	✓	✓
	Actuator Cycles and Travel	✓	✓	✓	✓	✓
	Data Monitor	✓	✓	✓	✓	✓
	Temperature and Humidity	✓	✓	✓	✓	✓
	Pilot Relay	✓	✓	✓	✓	✓
	Piezo Voltage	✓	✓	✓	✓	✓
	Pressures - Supply, Port A, Port B	✓	✓		✓	✓
	Friction		✓			✓
	Training (Finding Typical Behavior)		✓			✓
	Trends (Recording Long-Term Data)		✓			✓
	Continuous Stroke Test		✓			✓
	Actuator Pneumatic Leak		✓			✓
	Actuation Ratio (Ability to Actuate)		✓			✓
	Command Frequency and Amplitude		✓			✓
Position Frequency and Amplitude		✓			✓	

1 No advanced diagnostic information.
2 No pressure monitoring or information.

How to Order

Table 25: 520MD+ Positioner Configurations			
Selection	Description	Code	Example
Base Model	Intrinsically Safe, IP-66	5	5
Communications and Diagnostics	HART; 8-DIP Set-Up with LCD Option; Standard (Basic Functionality) ^{1,2}	20MD+	20MD+
	HART; 8-Dip Set-Up with LCD Option; Advanced (With Pressure Sensing) ^{1,2}	21MD+	
	HART; 8-Dip Set-Up with LCD Option; Pro (With Full ValveSight Diagnostics) ¹	22MD+	
Certifications	General Purpose	14	14
	North America/ATEX/IECEx Intrinsically Safe CI I Div 1 Gr A,B,C,D Ex ia IIC / Non-Incendive (North America only) CI I Div 2 Gr A,B,C,D	37	
Positioner Configuration		-	
Housing	Aluminum - Black Base with White Cover	W	W
	Aluminum - Black Base with Yellow Cover	Y	
	Aluminum - Black Base with Black Cover (Automax)	B	
	Aluminum - Black Base with Black Cover (Accord)	A	
Threaded Connections	Mounting: 5/16" 18 UNC, Pneumatics: 1/4" NPTF, Conduit: 1/2" NPTF, Vents 1/4" NPTF	1	1
	Mounting: M8 x 1.25, Pneumatics: 1/4" NPTF, Conduit: M20 x 1.5, Vents 1/4" NPTF	2	
	Mounting: M8 x 1.25, Pneumatics: G1/4", Conduit: M20 x 1.5, Vents G1/4"	3	
Feedback Shaft	D - 316 Stainless Steel Shaft (Valtek Standard)	D	D
	NAMUR - 316 Stainless Steel Shaft (VDI/VDE 3845)	R	
Action	Three-way (Single-Acting), Poppet Style Relay	1	1
	Three-way (Single-Acting), Spool Style Relay	2	
	Four-way (Double-Acting), Spool Style Relay	3	
Position Indicator	No Indicator	0	F
	Flat Indicator	F	
	Domed Indicator	D	
Special Options	No special options	0	0
	Chinese configuration ⁷		
Optional Mechanical Add-Ins		-	
Manifold	No Manifold ⁶	00	GM
	Gauge Manifold - Aluminum	GM	
Gauges	No Gauges	0	1
	Nickel Plated with Brass Internals, psi (bar/kPa) (Valtek Standard)	1	
	Nickel Plated with Brass Internals, psi (kg/cm ²)	2	
	SS with SS Internals, psi (bar/kPa)	3	
	SS with SS Internals, psi (kg/cm ²)	4	
	UCC Press Test Plug, 1/8" NPT	A	
Valve, Tank, Schrader 645A	B		
Optional Electronic Add-Ins		-	
Display	No LCD	0	1
	LCD	1	
Auxiliary Card Slot 1	Slot 1 - No Card	0	1
	Slot 1 - Multi-Function Card ³	1	
Auxiliary Card Slot 2	Slot 2 - No Card	0	0
	Slot 2 - Multi-Function Card ³	1	
Limit Switches	No Switches	0	3
	Mechanical Limit Switch ⁴	1	
	Reed Switch	2	
	Namur V3 type proximity switch, P+F NJ2-V3-N ⁴	3	
	Slot Type NAMUR Sensor, P+F S.J2 S1N ⁴	4	
	Slot Type NAMUR Sensor, P+F S.J2 SN ⁴	5	
	Namur V3 type proximity switch, P+F NBB2-V3-E2 ⁴	6	
Remote Mount Option ⁵	7		

¹ HART 6 standard. Can be configured as HART 5 or HART 7 in the field.

² Can be upgraded to 521MD+ or 522MD+ in the field.

³ Can be configured as Analog Output, Discrete Output or Discrete Input in the field. Slot 2 available only after Slot 1 is filled.

⁴ Only available for general purpose (certification option 14)

⁵ Includes adapter board (installed in the positioner) and the low profile remote mount unit (which may be shipped separately).

⁶ A VDI/VDE 3847 mounting kit can be purchased as a separate item.

⁷ Only available with 520MD+ model.

The Logix MD+ provides accurate and reliable control and diagnostic features for any control valve on the market.



Optimal Control Valve – Logix MD+ Combinations



Mark One

The Mark One control valve is the industry choice for a simple, reliable, tough globe valve. This control valve handles a wide selection of process control applications for flow, pressure, and temperature, including corrosive fluids, cryogenics, steam, water, gases, multiphase, high temperatures, erosion, and high pressure drops.

For more information see document number VLENTB0001



Trunnion Mounted Control Ball Valve (TMCBV)

The TMCBV is an ideal solution for loading arms, gas storage, compressor anti-surge, natural gas regulation and fuel gas applications.

For more information see document number VLENTB0068



MaxFlo 3

The MaxFlo 3 high-performance general service control valve is designed for applications demanding higher rangeability, precision control, and higher flow capacity.

For more information see document number VLENBR0052



FlowTop

The FlowTop high-performance control valve is a proven performer in the chemical, refinery, power, HVAC, and food and beverage industries. Zero emissions application options are achieved through the bellows seal solution. FlowTop is TA-Luft certified for fugitive emission leakage class greater than 10⁻⁸ mbarl/s.

For more information see document number SAEEBRV740



Flowserve Headquarters
5215 N. O'Connor Blvd. Suite 2300
Irving, Tx. 75039
Phone: +1 972 443 6500

Flowserve Corporation
Flow Control
1350 N. Mt. Springs Parkway
Springville, UT 84663 USA
Phone: +1 801 489 8611
Fax: +1 801 489 3719

Flowserve S.A.S.
12, avenue du Quebec
B.P. 645
91965 Courtaboeuf Cedex France
Phone: +33 (0) 1 60 92 32 51
Fax: +33 (0) 1 60 92 32 99

Flowserve Pte Ltd.
12 Tuas Avenue 20
Singapore 638824
Singapore
Phone: +65 6868 4600
Fax: +65 6862 4940

Flowserve Australia Pty Ltd.
14 Dalmore Drive
Scoresby, Victoria 3179 Australia
Phone: +61 7 32686866
Fax: +61 7 32685466

Flowserve Ltda .
Rua Tocantins, 128
São Caetano do Sul, SP 09580-130
Brazil
Phone: +55 11 2169 6300
Fax: +55 11 2169 6313

Flowserve Control Valves GmbH
Control Valves - Villach Operation
Kasernengasse 6
9500 Villach Austria
Phone: +43 (0)4242 41181 0
Fax: +43 (0)4242 41181 50

Flowserve (China)
585, Hanwei Plaza
7 Guanghau Road
Beijing, China 100004
Phone: +86 10 6561 1900

Flowserve India Controls
Pvt. Ltd Plot # 4, 1A, E.P.I.P,
Whitefield Bangalore Kamataka
India 560 066
Phone: +91 80 284 10 289
Fax: +91 80 284 10 286

Flowserve Essen GmbH
Schederhofstr. 71
45145 Essen Germany
Phone: +49 (0)201 8919 5
Fax: +49 (0)201 8919 662

Kämmer Valves inc.
1300 Parkway View Drive
Pittsburgh, Pa 15205 USA
Tel.: +1 412 787 8803
Fax: +1 412 787 1944

NAF Ab
Gelbgjutaregatan 2
SE-581 87 Linköping Sweden
Phone: +46 (0)13 31 61 00
Fax: +46 (0)13 13 60 54

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To find your local Flowserve representative please use the Sales Support Locator found at www.flowserve.com.

Or call

Europe +43 (0) 4242 41181 999

North America +1 801 489 2300

Asia +(65) 6879 8900

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